

CNMI and Guam Residents on the Marianas Trench Marine National Monument





Results of a Survey of CNMI and Guam Residents on the Marianas Trench Marine National Monument¹

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> > April 2015

¹ Adapted from PIFSC Data Report DR-13-009. Issued 10 April 2015.

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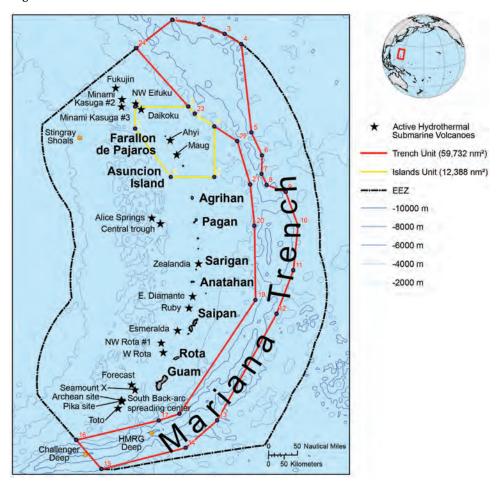
The full report of this study can be found online at http://www.pifsc.noaa.gov/library/pubs/DR-13-009.pdf



Introduction

In January 2009, President George W. Bush established the Marianas Trench Marine National Monument (Monument) by Presidential Proclamation 8335. The Monument encompasses approximately 95,216 square miles of area divided into three units within the 200-nm Exclusive Economic Zone around Guam and the Commonwealth of the Northern Mariana Islands (CNMI); the islands of these two U.S.-affiliated entities comprise the Mariana Archipelago. The Monument's Trench Unit, almost 1,100 miles long and 44 miles wide, extends along the length of the archipelago and includes only the submerged lands. The Volcanic Unit consists only of the submerged lands within 1 nm of 21 active undersea mud volcanoes and thermal vents scattered along the Mariana Arc. The Islands Unit includes both the waters and submerged lands below the mean water line within the unit boundaries around the three northernmost Mariana Islands: Farallon de Pajaros (also known as Uracas); Maug; and Asuncion. Within the Islands Unit of the monument commercial fishing is prohibited but sustenance, recreational, and traditional indigenous fishing can be allowed on a sustainable basis (Proclamation 8335, 2009).

Figure 1. Features and boundaries of the Marianas Trench Marine National Monument



The Secretary of the Department of the Interior (through the U.S. Fish and Wildlife Service) in consultation with Secretary of the Department of Commerce (through the National Oceanic and Atmospheric Administration) is responsible for management of the Monument in cooperation with the Department of Defense, U.S. Coast Guard, and the Government of the Commonwealth of the Northern Mariana Islands (Proclamation 8335, 2009).

A subsequent Secretary of the Interior action on January 16, 2009, delegated management responsibilities for the Monument to the Fish and Wildlife Service and placed two of the units (the Mariana Trench and Volcanic Units) within the National Wildlife Refuge System as the Mariana Trench and Mariana Arc of Fire National Wildlife Refuges (Secretary Order 3284, 2009).

To help guide development of a Monument Management Plan, Monument managers solicited comments from residents of CNMI and Guam at public scoping meetings in 2012. Participants provided comments on a wide range of issues and topics related to management of the Monument, including a proposed visitor center, a research program, ecosystem management, education and outreach, monitoring and enforcement, ancestral ties to the Monument, vessel groundings, climate change, and fishing.

In addition to these public meetings, management activities as described in the proclamation will include:

- public education programs and public outreach regarding the coral reef ecosystem and related marine resources, and species of the monument and efforts to conserve them;
- \bullet traditional access by indigenous persons for culturally significant subsistence, cultural, and religious uses within the monument;
- a program to assess and promote monument-related scientific exploration and research, tourism, recreation, and economic activities and opportunities in the CNMI;
- a process to consider requests for recreational fishing permits in certain areas of the Islands Unit, based on an analysis of the likely effects of such fishing on the marine ecosystems of these areas, sound professional judgment that such fishing will not materially interfere with or detract from the fulfillment of the purposes of this proclamation, and the extent to which such recreational fishing shall be managed as a sustainable activity; and
- programs for monitoring and enforcement necessary to ensure that scientific exploration and research, tourism, and recreational and commercial activities do not degrade the monument's coral reef ecosystem or related marine resources or species or diminish the Monument's natural character.

Designation of the Monument was accompanied by social debate over the merits of designation, potential economic benefits, increased federal management in the archipelago, impacts to fishermen and fishing communities, and other effects (Kotowicz and Richmond, 2013). Now that the Monument has been established and management planning is ongoing, there is a need for research to define CNMI and Guam residents' management preferences and their perceptions of Monument impacts to inform managers as they develop and begin to implement the plan.

Methodology

With funding from the NOAA Fisheries Pacific Islands Regional Office, the Human Dimnsions Research Program (HDRP) hired an established polling firm, American Directions Group, Inc. to conduct the survey. The survey was conducted by telephone from January 9 through February 12, 2012. The sample was designed for a total of 1,000 respondents selected using random digit dialing (RDD) phone interviews, with 500 randomly selected Guam residents and 500 randomly selected CNMI residents. Two hundred of the 1,000 interviews were initiated as cell phone calls to include residents who were more likely to be reached by cell phone.

Table I. Sampling and call mode of CNMI monument survey

	Call Mode			
Location	Total	Landline	Cell Phone	
Guam	500	400	100	
CNMI	500	400	100	
Total	1,000	800	200	

Using the RDD approach results in potentially a large number of business and other, non-residential phone numbers, as well as non-working residential phone numbers; these are all classified as unknown contact outcomes. When considering completed surveys divided by the number of attempted interviews (not including unknown contact outcomes), the response rate was 50%. The overall response rate to the survey was 38%. This represents the proportion of completed surveys from the total number of attempted interviews including all calls placed to households. Considering this survey was a RDD phone interview, this is a reasonable response rate.

All estimates provided from the survey are within +/- 4.2% of population values at the 95% confidence level. For example, if 52% of the respondents reported a particular attitude toward the Monument, then we can be 95% confident that between 47.8% and 56.2% of the entire population has the same attitude.

The survey was pretested with 9 Guam/CNMI respondents and each interview was audiotaped. The results of the pretest were used to revise survey questions and interviewer instructions before the final survey effort began. All interviewers received a full project briefing. A formal review of each question was conducted that addressed any potential issues, pronunciations of names and coding of responses. Interviews were conducted in English when possible. As needed, translation services were provided for respondents speaking Chamorro and Tagalog, the most prevalent non-English languages in Guam and CNMI. Other Asian-speaking respondents (126, after sample adjustment) were encountered, including those speaking Korean, Vietnamese, and Chinese. When possible, an English-speaker in these households was interviewed; otherwise, the interview was not conducted. This introduces a slight bias due to the lack of language capabilities.²

For further discussion see Limitations of the Study

Data were reviewed after completion of 25, 100, 250 interviews and after the final dataset of 1000 interviews was compiled to fine tune the interviewer-respondent dialog and ensure accurate and complete data were collected.

The survey contained questions on awareness, knowledge, and attitudes of residents regarding the Monument; preferences for management and scientific research; and levels of interest in becoming involved in Monument management and outreach activities. Additional questions included experiences with and attitudes toward current uses of coastal and marine resources, to provide a context for interpreting responses regarding the Monument.

The full report of this study can be found online at http://www.pifsc.noaa.gov/library/pubs/DR-13-009.pdf



Key findings

People from CNMI were more likely than people from Guam to have heard about the Monument, although substantial proportions of both said they had not heard about the Monument until receiving the survey.

Of those who said they had been aware of the Monument, over half from each area (Guam and CNMI) reported having little or no information about it. The mass media (radio, television, newspaper) was the most common way they had gotten information about the Monument.

Very few of the respondents had visited one of three islands that are now included in the Islands Unit of the Monument (Uracas, Maug, Asuncion), but about half of the CNMI residents and a quarter of the Guam residents said they knew someone who had visited one or more of the islands.

Of those who said they had heard of the Monument, a majority from both Guam and CNMI said they did not believe an adequate attempt had been made to understand and include the views of Guam and CNMI residents regarding the Monument's designation.

CNMI residents were far more likely than Guam residents to have participated in activities associated with Monument designation or planning, mostly by discussing it with other people or reading about it.

Of those who had heard about the Monument, more people supported designation than opposed it, although a substantial proportion were neutral. After receiving some background information about the Monument – its location, activities to be managed within it, and the government entities jointly managing it – respondents were again asked their attitude toward the Monument, and support increased while neutrality and opposition decreased among both Guam and CNMI residents.

Residents of both Guam and CNMI tended to believe that the Monument would have a range of positive economic effects. A majority did not believe that their households would be directly affected; of those who thought their household could be affected, more people thought the effects would be positive than negative, although many thought there could be both positive and negative effects.

The residents supported a broad range of activities within the Monument such as charter/private boat recreational fishing, fishing for food while in the Monument, traditional indigenous fishing, cultural and religious uses other than fishing, tourism, scientific research, and monitoring and enforcement. More Guam residents supported military activities within the Monument than opposed them, while more CNMI residents opposed military activities than supported them.

The residents strongly supported a wide range of research activities within the Monument, such as protected species, fish populations, and coral reef diversity, as well as the dissemination of research results within the schools and broader community.

People wanted to be kept informed about Monument planning and management activities, through a variety of methods. The most popular methods were radio, TV and newspaper.

Guam and CNMI residents had similar perceptions of the condition of reefs and associated fish populations around their respective island areas, with the highest proportions rating conditions as good or neutral; both groups rated of the condition of farther offshore, open ocean waters and fish populations higher.

Almost 40% of respondents from Guam and CNMI reported that they were not familiar with existing nearshore marine protected areas in their jurisdiction. They viewed MPAs in general as having positive effects although almost half of the sample from Guam and CNMI felt that MPAs can reduce access to traditional fishing.

CNMI residents were most likely to say there were no existing conflicts over uses of the ocean and coast around their jurisdiction, while Guam residents were divided between perceiving no conflict and moderate levels of conflict. About the same proportion of each group said there was lots of conflict as said there was little conflict. Residents supported coastal and marine spatial planning efforts to reduce conflicts.

Guam and CNMI residents had similar perceptions of what constituted commercial fishing, with the highest proportion saying that it's a commercial fishing trip if the fish are sold for profit or if any fish caught on the trip are sold. A lower proportion said that bartering or trading fish, or selling fish to pay expenses, would constitute a commercial fishing trip, but a majority of both Guam and CNMI residents still believed this would be a commercial trip. A majority felt that a trip in which fish caught on the trip were shared with the community would mean the trip was not commercial.

A little over a third of the sample reported that they or someone else in their household was a fisherman and provided information such as their household's orientation to fishing including the number of boat-based and shore-based trips taken over the past year. Respondents from Guam and CNMI fishing households were more likely to be polarized regarding their current attitude toward the Monument; higher proportions were strongly opposed and strongly supportive of the Monument compared to non-fishing households, which had greater proportions of respondents who reported being neutral. Respondents from fishing households answered many questions similarly to respondents from non-fishing households but there were some important differences which are highlighted in the report.

Demographic characteristics (income, education, age, gender) of the sample of 500 residents of Guam and 500 residents of CNMI were generally similar to the demographic characteristics of the Guam and CNMI populations as measured by the 2010 Census.

Fishing Households in Survey Sample

Although the goal of this survey was to assess a sample of the general populations of CNMI and Guam, designation of Monument waters in fishing grounds and associated regulations on fishing are especially important for fishing households. Therefore, in the analyses below, any differences in responses by fishing and non-fishing households are identified.

Thirty-five percent of the Guam sample and 37% of the CNMI sample said they or someone else in their household was a fisherman. Thirty percent of the Guam and 24% of the CNMI respondents said they were the only fisherman in the household, about 40% from each said the fisherman was another member of the household, and 29% of the Guam and 37% of the CNMI respondents said they and one or more other household members were fishermen. This means that the actual sample of respondents included 103 Guam respondents who reported being fishermen on Guam (21% of the Guam sample) and 112 CNMI respondents who reported being fishermen (22% of the CNMI sample).

Respondents from fishing households in CNMI tended to be younger than respondents from CNMI non-fishing households, and respondents from fishing households in both jurisdictions tended to have lower education levels, with about half as many graduating from college. More than twice as many respondents from CNMI fishing households reported being unemployed (20%) compared to respondents from non-fishing households (9%); the proportion of unemployed respondents from Guam fishing households (17%) was also higher than the rate for non-fishing households (10%). However, there was no clear difference in the level of household income between fishing and non-fishing households in either jurisdiction.

Respondents from fishing households tended to be less likely to say they were neutral or not have an opinion on a variety of questions, compared to respondents from non-fishing households. They were also more likely to use the extreme ends of the five-point scales--for example, to "strongly oppose" or "strongly support" an activity rather than "support" or "oppose" it, even if the direction of their attitudes was the same as that of respondents from non-fishing households. This suggests that respondents from fishing households held stronger opinions on many issues than did respondents from non-fishing households.



Responses to Survey Questions

Survey questions probed a wide range of topics with the aim of understanding residents' views about the new Monument. interviewees were asked how they learned about the Monument, their impressions of its impact, their level of support for potential activities within the Monument, and their likelihood of engaging in Monument planning, among other topics. Results were summarized and are presented for respondents in both Guam and CNMI. In addition, responses were further analyzed within 2 categories of respondents: those from households with at least one member who fished and those from non-fishing households. A Pearson's chi-square test was used to examine if responses were statistically significantly different (p < 0.05) between fishing households and households that were not involved in fishing.



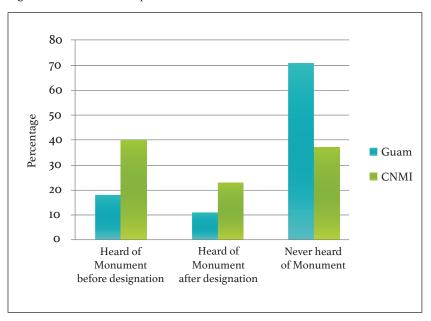
When you see results below marked by a fish hook, it means that we found meaningful differences between fishing and non-fishing households.

In a few places, we also compare results of this survey with findings of a related 2011 survey of 146 small-boat fishermen from Guam and 114 from CNMI (Hospital and Beavers, 2012; 2014)



Are people aware of the Monument?

Figure 2. Distribution of respondents' awareness of the Monument



As would be expected, a higher percentage of CNMI residents said they had heard of the Monument compared with Guam residents. Forty percent of CNMI residents first heard of the Monument before it was designated and 23% after it was designated. Thirty-seven percent had never heard of it, so were learning about it for the first time through the survey. In contrast, just 18% of Guam residents heard about the Monument before it was designated, 11% after it was designated, and 71% had never heard of it.

People who had visited one or more of the islands now comprising the Islands Unit, or who knew someone who had were more likely to have heard about the Monument before it was designated.



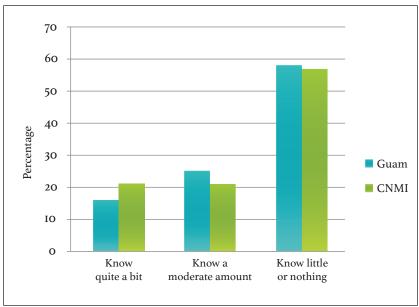
Fishing households on Guam were more likely to have heard about the Monument before or after designation; the same tendency was found among CNMI fishing households, but not at a statistically significant level.



How much do people know about the Monument and where do they get their information?

Of those respondents who said they had heard about the Monument before the survey, CNMI and Guam residents appeared to have comparable levels of knowledge about it.

Figure 3. Distribution of respondents' level of knowledge of Monument







In Guam, fishing households were more likely to report they were knowledgeable about the Monument than were respondents from non-fishing households, a difference not found for CNMI residents.

Guam and CNMI small boat fishermen surveyed in 2011 by Hospital and Beavers (2012; 2014) reported relatively high levels of familiarity with the Monument: in that study 27% of Guam fishermen and 22% of CNMI fishermen said they were extremely familiar with the Monument, 64% from Guam and 71% from CNMI said they were somewhat familiar with the Monument, and less than 10% from each area said they had never heard of it.

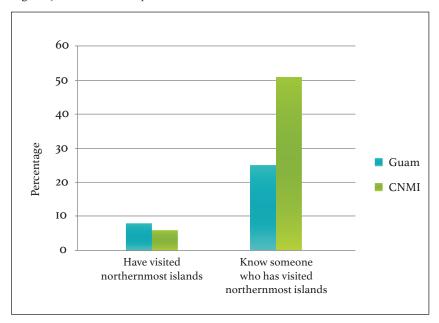
If survey respondents had heard about the Monument, they also were asked to list the way or ways they had heard about it. The most common ways in which survey respondents from both Guam and CNMI learned about the Monument were from radio, TV or newspapers followed by learning about it through friends and/or family.

Table 2. Distribution of way in which respondents learned about the Monument

	Guam residents		CNMI resi	dents
How first heard about Monument:	Count	Percent	Count	Percent
Radio, TV or newspaper	86	52	214	57
Friends/family	27	17	44	12
Meeting	2	I	13	4
Friends of Monument	6	4	31	8
Internet	6	4	10	3
Government Official	9	6	22	6
Other source	28	17	34	9
Total	164	100	376	100

Some respondents' knowledge about the Monument, or at least the three northernmost islands, may have come from their personal experience or conversations with others who had personal experience. Comparable proportions of both samples (CNMI and Guam) said they had visited one of three islands that are now included in the Islands Unit (Uracas, Maug, Asuncion), but about twice as many CNMI residents (51%) said they knew someone else such as a friend or relative who had been to the northernmost islands than did Guam residents (25%).

Figure 4. Distribution of respondents that visited the northernmost islands or knew someone who did





Respondents from fishing households in both Guam and CNMI were more likely to say they had visited Uracas, Maug or Asuncion (14% Guam, 10% CNMI) than were respondents from non-fishing households (5% Guam, 5% CNMI). They were also more likely to report knowing someone else who had visited one or more of the three islands (39% Guam, 65% CNMI) than were non-fishing households (17% Guam, 42% CNMI).

CNMI residents were far more likely to have participated in past activities associated with Monument designation or planning, mostly by discussing it with other people or reading about it.

Table 3. Distribution of interest in participation in types of Monument activities

	Guam residents		CNMI residents	
Participation in Monument activities:	Count	Percent	Count	Percent
Attended Meeting	8	9	39	15
Wrote letter	2	2	IO	4
Member of advocacy group	4	5	9	4
Read about it	23	27	65	25
Discussed it	42	49	IO	41
Other	6	7	28	II
Total	85	100	256	100

If they had heard of the Monument, respondents also were asked if they believed there was an adequate attempt to understand and include the views of Guam and CNMI residents regarding the Monument designation. Thirty-nine percent of the Guam residents and 47% of CNMI residents said yes, while 61% of Guam residents and 53% of CNMI residents said no.



Respondents from CNMI fishing households tended to believe that there was not an adequate attempt to incorporate resident views, but the difference between fishing and non-fishing households on this question was not statistically significant. Likewise, no such distinction was found on Guam.



What are people's attitudes toward the Monument?

Of the Guam and CNMI respondents who had heard of the Monument, slightly less than one-fifth of respondents from each place said they strongly supported the Monument when they first heard about it, and the most common response from residents of Guam and CNMI was that they supported it. For both CNMI and Guam, respondents who had heard of the Monument before this survey were least likely to strongly oppose it.

During the survey, respondents received information about the Monument including when it was designated, where it is located, what types of activities will be managed within it and what government entities will be involved in its management. When asked about their current attitude toward the Monument (near the end of the survey), a majority of CNMI residents said they strongly support the Monument and almost three quarters either strongly support or support it. Similarly, just less than half of Guam residents said they strongly support the Monument and just less than three quarters either strongly support or support it. Subsequent levels of support appeared to be higher than initial levels for both populations, whether from what was learned about the Monument in the intervening time, or simply from the issues and topics raised in the survey itself.

Table 4. Level of support or opposition to Monument when they first heard about it and at the conclusion of the survey

	Guam residents		CNMI residents	
Attitudes toward Monument	Attitude when first heard about it (%)	Current attitude (%)	Attitude when first heard about it (%)	Current attitude (%)
Strongly support	19	47	18	51
Support	34	25	31	20
Neutral	30	20	24	19
Oppose	9	3	12	2
Strongly oppose	2	4	5	6

People who knew either quite a bit or a moderate amount about the Monument tended to have an opinion, rather than be neutral, but did not fall on one side or the other (support or opposition).



Respondents from fishing households on CNMI were more likely than those from non-fishing households to oppose the Monument when they first heard about it; this distinction was not found on Guam.



Respondents from Guam and CNMI fishing households were more likely to be polarized regarding their current attitude toward the Monument; higher proportions were strongly opposed and strongly supportive of the Monument compared to non-fishing households, which had greater proportions of respondents who reported being neutral.



What effects do people anticipate will occur because of the Monument?

Respondents were provided with some basic information about the Monument; that it was designated in 2009 and is made up of certain waters and submerged lands in the Northern Mariana Islands chain and the Marianas Trench. They were told that within the Monument, activities such as scientific research, fishing practices and access will be jointly managed by the Federal Government, including NOAA Fisheries and the Fish and Wildlife Service, and representatives from the Guam and CNMI Territorial Governments.

Respondents were then asked their perceptions of the likelihood that the Monument would provide various benefits to the local economy. Several items in the list of benefits were taken from statements made by advocacy groups during debate over the Monument.

The potential effect that the most survey respondents reported they think will probably or definitely occur from both Guam and CNMI is increased visits by research scientists (69% of Guam and 71% of CNMI respondents). Increased tourism even if the Monument is not visited is the effect that the highest percentage of respondents reported they believe will probably or definitely not occur (33% of Guam and 35% of CNMI respondents).

Table 5a. Guam residents level of perceptions of likelihood the Monument will provide types of benefits to the local economy

	Guam residents			
Potential effect of Monument:	% state effect probably or definitely WILL occur	% state effect probably or definitely WILL NOT occur		
More media coverage	52	20		
Increased tourism due to interest in the Monument	51	24		
Increased tourism even if Monument is not visited	37	33		
Increased visits by research scientists	69	12		
400 more local jobs	46	26		
Economic benefits of \$10 million annually	42	29		
Establishment of visitor center on Saipan	44	26		

Table 5b. CNMI residents level of perceptions of likelihood the Monument will provide types of benefits to the local economy

	CNMI residents			
Potential effect of Monument:	% state effect probably or definitely WILL occur	% state effect probably or definitely WILL NOT occur		
More media coverage	58	16		
Increased tourism due to interest in the Monument	59	22		
Increased tourism even if Monument is not visited	40	35		
Increased visits by research scientists	71	II		
400 more local jobs	51	25		
Economic benefits of \$10 million annually	48	23		
Establishment of visitor center on Saipan	57	18		

In a separate study by Hospital and Beavers (2012; 2014), small-boat fishermen surveyed in Guam and CNMI were asked if they thought the Monument would benefit the local economy. Twenty two percent from Guam and 24% from CNMI

answered "yes", 41% from Guam and 31% from CNMI answered "no", and 38% from Guam and 45% from CNMI said they were not sure.

In our phone survey, respondents were also asked if they felt that the Monument will improve protection of marine resources in waters around the Marianas. Eightysix percent of Guam residents and 89% of CNMI residents said "yes", protection would improve.

Small boat fishermen surveyed in a separate study (Hospital and Beavers, 2012;2014) were asked if they thought the Monument would help to increase their catch rates. Sixteen percent from Guam and 12% from CNMI answered "yes", 43% from Guam and 40% from CNMI answered "no", and 42% from Guam and 48% from CNMI said they were not sure.

Respondents were asked about possible effects of the Monument on themselves and their households. Twenty-one percent of Guam residents thought that the Monument would have some effect on their households, while 59% thought it would not, and 18% believed they might or might not be affected. Similarly, 26% of CNMI residents thought that the Monument would have some effect on their households, while 54% thought it would not, and 17% believed they might or might not be affected.

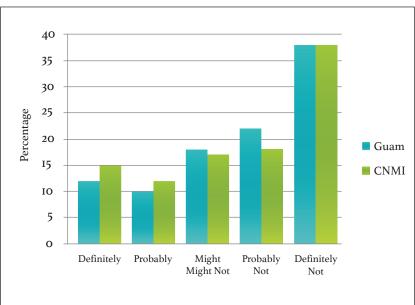


Figure 5. Level of expectation that respondents' household will be affected by the Monument

Respondents were asked what type of effect they expected on their households (people who said they definitely would not be affected were not asked the question). Respondents from both Guam and CNMI tended to think that the effects would be either positive or a mixture of positive and negative. Few people expected the effects to be strong but of those who did, more thought they would be positive than negative.



There was no difference between fishing and nonfishing households in either jurisdiction regarding the likelihood that the Monument would affect their households or, if some effect was anticipated, whether it would be positive, negative, or both.



What activities do people support in the Monument?

Respondents were informed that their input would be used to develop a management plan, and asked about their level of support for or opposition to various potential activities within the Monument. Guam and CNMI residents had similar patterns of responses, with strongest support for scientific research and tourism, and lowest support for military activities.

Figure 6. Type of effect anticipated due to Monument, for respondents that anticipated an effect

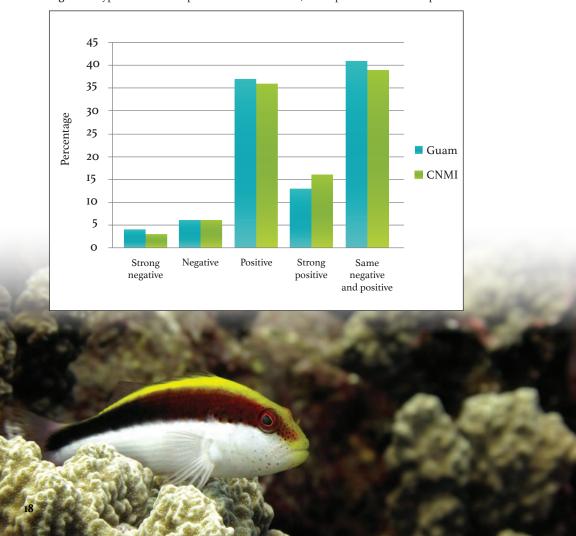


Table 6a. Guam residents distribution of level of support or opposition for allowing activities in the Monument

	Guam residents	
Activity:	% who support or strongly support	% who oppose or strongly oppose
Charter/private boat recreational fishing	56	21
Fishing for food while in the Monument	57	23
Traditional indigenous fishing	64	18
Tourism	7 <u>I</u>	IO
Scientific Research	83	7
Cultural and religious uses other than fishing	59	17
Monitoring and enforcement	71	IO
Military activities	46	28

Table 6b. CNMI residents distribution of level of support of opposition for allowing activities in the Monument

	CNMI residents	
Activity:	% who support or strongly support	% who oppose or strongly oppose
Charter/private boat recreational fishing	53	23
Fishing for food while in the Monument	56	24
Traditional indigenous fishing	61	18
Tourism	79	II
Scientific Research	82	6
Cultural and religious uses other than fishing	57	16
Monitoring and enforcement	69	12
Military activities	36	4I



Respondents from fishing households were more likely to strongly support fishing for food and traditional indigenous fishing in the Monument than were respondents from non-fishing households.

Respondents from Guam fishing households were more likely than those from non-fishing households to strongly support charter and recreational fishing in the Monument, but this difference was not found for CNMI respondents. Respondents from Guam fishing households were also more likely than those from non-fishing households to strongly support cultural and religious uses other than fishing, and to strongly support monitoring and enforcement in the Monument. Respondents from CNMI fishing households were less likely to support military activities in the Monument than were respondents from non-fishing households.

Respondents were informed that permits could be required for some types of public use activities within the Monument, and asked whether they thought that the permit process should be more restrictive, to err on the side of resource protection, or less restrictive, to err on the side of resource use. Regardless of their place of residence, 64% of respondents thought permits should be more restrictive, and 36% thought the process should be less restrictive.



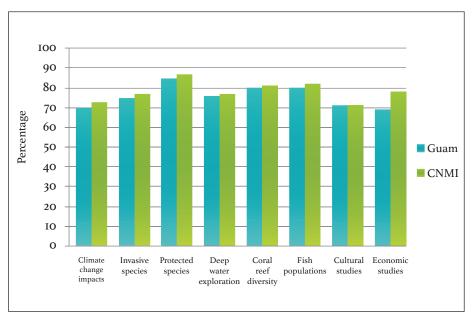
A majority of both fishing and non-fishing households believed that public use permits should be more restrictive and err on the side of resource protection than should be less restrictive to err on the side of resource use. However, a lower proportion of respondents from Guam fishing households felt this way.



What kind of scientific research do people support in the Monument?

The survey also informed people that the Monument would provide opportunities for scientific research and study of the unique ecosystem components, and asked about people's level of interest in a number of possible research topics. There were few differences between Guam and CNMI residents who were interested in research on the full range of topics. Another reflection of the high level of interest was that uniformly across topics, about twice as many people were very interested than were interested, and of the remainder, most were neutral rather opposed to any particular topic.

Figure 7. Distribution of respondents 'interested' or 'very interested' in types scientific research in the Monument







In general, respondents from fishing households were more likely to say they were very interested in a full range of research topics associated with the Monument than were respondents from non-fishing households. This was especially true for the topics of fish populations, coral reef diversity, invasive species, and protected species. The differences between fishing and non-fishing households tended to be larger for Guam than CNMI respondents.

Given this level of interest it's not surprising that 97% of Guam and 95% of CNMI residents strongly supported having scientists present their Monument research results locally. Forth-nine percent of Guam residents and 63% of CNMI residents said they would be likely or very likely to attend presentations of scientists' results of studies in the Monument.

Ninety percent of Guam residents and 90% of CNMI residents said they support or strongly support using Monument science results to increase marine education in the schools. Fifty-eight percent of Guam residents and 71% of CNMI residents said they would be likely or very likely to volunteer to help visiting scientists with science education for local students, researchers, and educators.



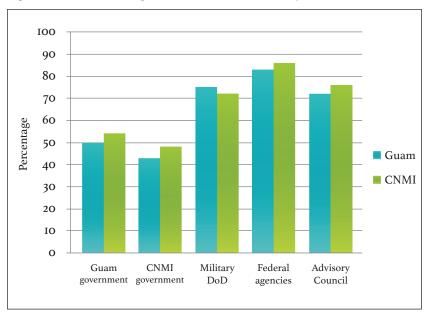
Respondents from fishing households reported higher levels of anticipated interest in Monument science activities, such as attending scientists' presentations of their results, than respondents from non-fishing households.



How much confidence do people have in Monument managers?

The administrators of the survey informed people that a number of government entities would be involved in management of the Monument, including NOAA Fisheries, the U.S. Fish and Wildlife Service, the governments of Guam and CNMI, an advisory council with federal and CNMI members, and the military/Department of Defense. People were asked whether they had no confidence, low confidence, moderate confidence, or high confidence in the ability of each entity to manage the Monument.





Survey respondents from both Guam and CNMI most often reported moderate or strong confidence in federal agencies' ability to manage the Monument. Respondents from both Guam and CNMI rated the CNMI government with the lowest percentage of moderate or strong confidence in their ability to manage the Monument.



How would people like to be involved in Monument-related activities?

Eighty-seven percent of CNMI residents and 77% of Guam residents said they would like to be updated on the status of the Monument activities and specified their preferred methods of being kept informed of Monument activities; these included public meetings, public schools, newsletters, Radio/TV and other media, including social media.

Table 7. Preferred method of outreach about Monument activities

	Guam residents		CNMI resi	dents
Preferred method of outreach:	Count	Percent	Count	Percent
Public meeting	156	II	217	14
Public school	169	12	2II	13
Newsletter	201	15	233	15
Facebook/blog/web	242	17	269	17
Newspaper	282	20	320	20
Radio/TV	299	22	301	19
Other	42	3	23	2

Forty-seven percent of Guam residents and 59% of CNMI residents said they would be likely or very likely to attend public meetings related to creating the management plan for the Monument. Forty-seven percent of Guam residents said they would likely or very likely visit a Monument Visitor Center on Guam, compared to 64% of CNMI residents who said they would be likely or very likely to visit a Visitor Center located in CNMI.



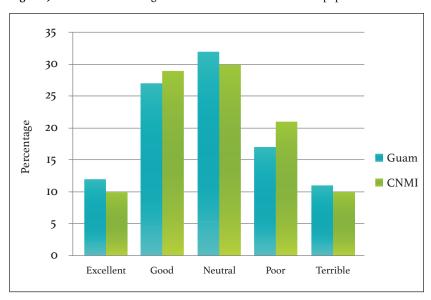
Respondents from both Guam and CNMI fishing households were more likely to report wanting updates on the status of the management plan, and reported that they were more likely to be involved in a full range of Monument planning/management activities, such as attending public meetings on the management plan, or going to a Monument visitor center.



How do people perceive current conditions of the marine ecosystem and nearshore marine protected areas?

Guam and CNMI residents had similar perceptions of the condition of reefs and associated fish populations around their respective island areas. In both areas, less than 40% rated the conditions as excellent or good and about 30% rated them as neutral. Twenty-eight percent of Guam residents rated conditions around Guam as poor or terrible, and 31% of CNMI residents rated conditions around CNMI as poor or terrible. Both groups rated the condition of open ocean waters and fish populations farther offshore higher, with only 18% of Guam residents and 20% of CNMI residents rating conditions there as poor or terrible.

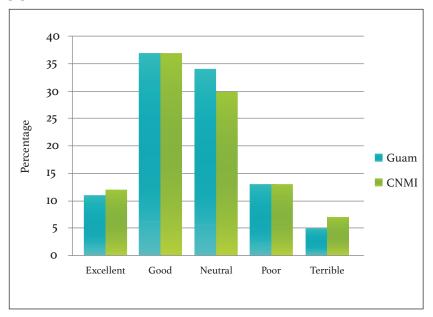






Respondents from Guam and CNMI fishing households were more likely to rate reef water and fish populations around their jurisdiction as poor or terrible (35% Guam and 39% CNMI) compared to respondents from non-fishing households (24% Guam and 26% CNMI).

Figure 10. Distribution of rating of condition of farther offshore, open ocean waters and fish populations



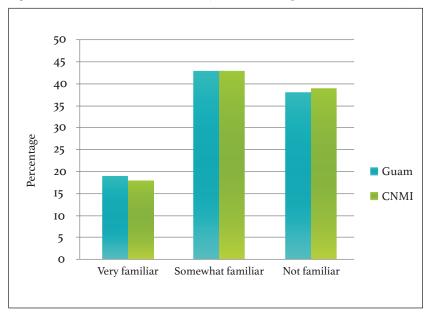


In Guam, respondents from fishing households were more likely to rate offshore, open ocean waters and fish populations around their jurisdiction as poor or terrible (24%) compared to respondents from non-fishing households (15%).

Guam and CNMI residents had very similar levels of awareness of nearshore protected areas near their jurisdictions, with about 20% reporting being very familiar with these areas and 43% somewhat familiar.



Figure II. Distribution of level of familiarity with nearshore protected areas in their jurisdiction





Respondents from Guam and CNMI fishing households were much more likely to report being very familiar with nearshore protected areas around their jurisdiction (37% in Guam and 27% in CNMI) compared to respondents from non-fishing households (10% in Guam and 12% in CNMI).

Seventy percent of Guam residents and 64% of CNMI residents said that designation of these areas did not change their use of coasts and waters, while 30% of Guam and 36% of CNMI residents said designation had changed how they used coasts and waters.



Respondents from Guam and CNMI fishing households were much more likely to report that their use of nearshore waters had changed after protected areas were designated (56% in Guam and 49% in CNMI) compared to respondents from nonfishing households (17% in Guam and 28% in CNMI).

Respondents were asked whether they agreed or disagreed with statements people have made about the effects or conditions of nearshore marine protected areas. The question wording was not specific to MPAs around Guam or CNMI.

People's self-reported level of familiarity with nearshore MPAs were related to these responses; respondents who reported being more familiar with nearshore MPAs

tended to have more polarized opinions on the effects of them as reported in the table below.

Table 8. Distribution of agreement of disagreement with statement about nearshore MPAs

	Guam residents		CNMI residents	
Statement about nearshore MPA:	% who agree or strongly agree	% who disagree or strongly disagree	% who agree or strongly agree	% who disagree or strongly disagree
They increase the number of fish inside the preserve	68	9	67	12
They are not needed to protect habitats and marine resources	29	50	28	52
They increase the number of fish outside the preserve	56	14	58	14
They protect cultural resources	65	12	67	13
They provide educational opportunities	66	12	70	13
They reduce access to traditional fishing	47	24	46	24
They do not provide benefits to the local economy	31	40	30	43
They are well enforced	54	20	49	23

Regarding perceptions about the effects of nearshore marine protected areas, results varied by question and jurisdiction. In Guam, the highest percentage of respondents agreed or strongly agreed (68%) with the statement that nearshore MPAs increase the number of fish inside the preserve. The statement with the highest percentage of respondents in Guam that disagreed or strongly disagreed (50%) was that nearshore MPAs are not needed to protect habitats and marine resources. Respondents from CNMI most often agreed or strongly agreed (70%) that nearshore MPAs provide educational opportunities and they most often disagreed or strongly disagreed (52%) that nearshore MPAs are not needed to protect habitats and marine resources.

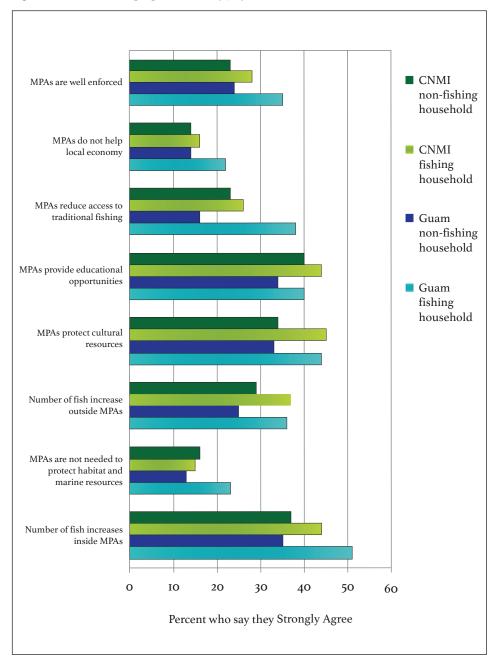


Respondents from fishing households on Guam were much more likely than those from non-fishing households to strongly agree that nearshore MPAs reduce access to traditional fishing, but the same difference was not found among CNMI respondents. Respondents from fishing households in both Guam and CNMI were more likely than non-fishing households to strongly agree that the numbers of fish increase both inside and outside the MPA.

Small boat fishermen surveyed in a separate study (Hospital and Beavers, 2012;2014) were asked how effective MPAs have been in promoting sustainable nearshore fisheries in the Marianas. Twenty-six percent from Guam and 26% from CNMI an-

swered "extremely effective", 35% from Guam and 35% from CNMI said "somewhat effective", 10% from Guam and 4% from CNMI said "somewhat ineffective", and 9% from Guam and 7% from CNMI said "not effective at all." Twenty-one percent from Guam and 29% from CNMI said they were neutral regarding the effects of MPAs on sustainable nearshore fisheries.

Figure 12. Distribution of people who 'strongly agree' with several statements about MPAs

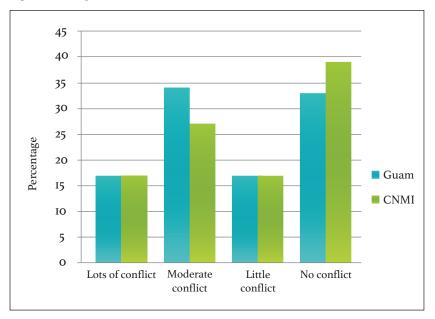




Do people perceive there are conflicts among coastal and ocean uses?

When asked about their perceptions of conflict over uses of the ocean and coast around their area of residence (Guam or CNMI), CNMI respondents were most likely to say no conflicts currently exist, while Guam residents were divided between perceiving no conflict and moderate levels of conflict. About the same proportion of each sample said there was lots of conflict as said there was little conflict.

Figure 13. Perceptions about level of conflict in ocean and coastal areas in their jurisdiction





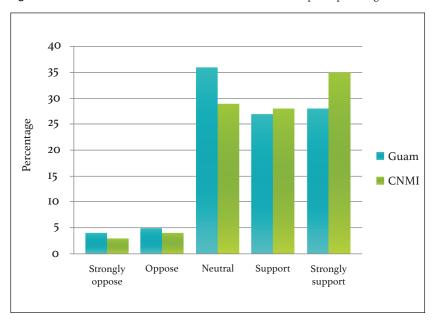
In both Guam and CNMI, respondents from fishing households were more likely to perceive conflict on the ocean and coast around their jurisdiction than were non-fishing households. Twenty-one percent of the respondents from fishing households on Guam and 30% from CNMI said there was no conflict, while 40% of the respondents from non-fishing households said there was no conflict around Guam and 45% said there were no conflicts around CNMI.



Do people support marine and coastal spatial planning?

Respondents were informed about coastal and marine spatial planning, which was defined as designating zones for one or more uses to address user conflicts, and asked about their level of support for such planning. Far more residents of both areas supported coastal and marine spatial planning efforts than opposed them, although support was higher, and opposition or neutrality lower, for CNMI residents.

Figure 14. Distribution of attitudes toward coastal and marine spatial planning





In Guam, respondents from fishing households were more likely to strongly support coastal and marine spatial planning (36%) than were respondents from non-fishing households (24%). A similar relationship was not found in CNMI.

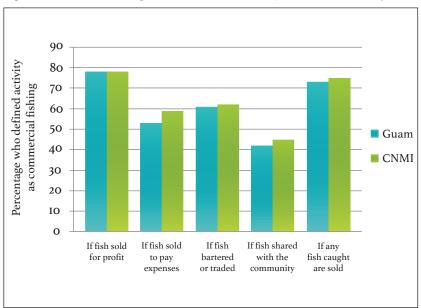


How do people define commercial fishing?

Commercial fishing is prohibited in the Islands Unit, so we were interested in how residents of CNMI and Guam define commercial fishing. Guam and CNMI residents had similar perceptions of what constituted commercial fishing, with the highest proportion saying that it's a commercial fishing trip if the fish are sold for profit or if any fish caught on the trip are sold. A lower proportion, but still a majority, said that bartering or trading fish, or selling fish to pay expenses, would constitute a commercial fishing trip. In both Guam and CNMI, a majority felt that sharing fish with the community would not mean the trip was a commercial one.









Fishing and non-fishing household respondents tended to have the same definitions of what constituted commercial fishing, except that more CNMI fishing household respondents viewed trading or bartering fish, and selling any fish caught on the trip, as a commercial activity than did respondents from non-fishing households—although a majority of both types of households did define these activities as commercial.

Small boat fishermen surveyed in a separate study (Hospital and Beavers, 2012; 2014) were asked how they would define a fisherman as commercial. The questions were asked somewhat differently than in the Monument survey, but the results can still be compared. Just 5% of Guam fishermen and 3% of those from CNMI said that selling even one fish would make someone a commercial fisherman. Fishermen from both areas agreed that selling fish for profit (where sales would contribute to personal income) would make someone a commercial fisherman, but the proportion of income derived from fishing had an effect; the highest proportion of fishermen reported that a fisherman would be commercial if all of their personal income came from fishing, while a lower proportion of respondents said a fisherman would be commercial if half of their income came from fishing, and an even lower proportion said a fisherman would be commercial if one-quarter of his income came from fishing. Relatively small percentages of the fishermen defined themselves as part-time or full-time commercial fishermen, while higher percentages described themselves as cultural, subsistence, recreational expense, or purely recreational fishermen, and high proportions also reported having multiple motivations for fishing.

Characteristics of Fishing Households

Thirty-five percent of the Guam sample and 37% of the CNMI sample said they or someone else in their household was a fisherman. In households with fishermen, 33% of the households contained one fisherman, 24% had two, 17% had three, 9% had four, and 12% had five to eight fishermen in the household. Four respondents from Guam (4%) and three from CNMI (4%) reported having 10 or more fishermen in their household.

To learn more about the characteristics of fishing households, several supplemental questions were asked of respondents reporting that they live in a household where one or more member is a fisherman. Respondents in fishing households were asked how their household utilizes fish. Fishing was reported as a main or supplemental income source in a higher proportion of CNMI fishing households than in Guam fishing households. Fish also was described as a regular source of food in a greater number of CNMI households than Guam households, although it was important to a sizeable majority in both. Providing fish for others or for community and cultural events was roughly equal in importance to both Guam and CNMI fishing households, as was fishing for recreation.

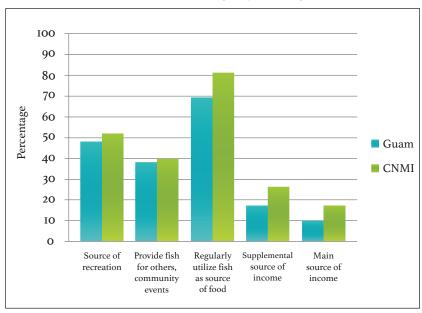
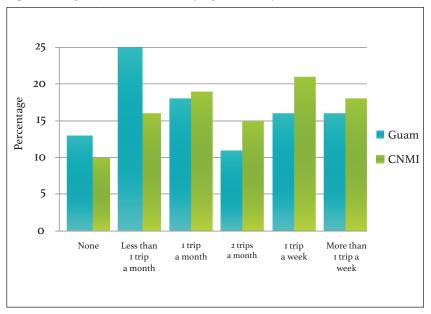


Figure 16. Distribution of orientation to fishing (only for fishing households)

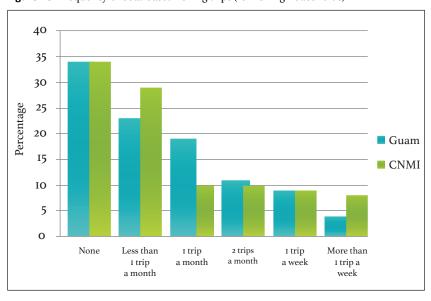
When asked about how many times a fisherman from the household fished from shore over the past 12 months, respondents from CNMI reported fishing from shore more frequently (54% taking two or more trips a month) than did respondents from Guam (43% taking two or more trips a month).

Figure 17. Frequency of shoreline fishing trips (for fishing households)



As would be expected given the greater costs associated with boat-based trips, as well as the need to own or have access to a boat, Guam and CNMI fishing house-holds reported taking fewer boat-based trips than shoreline trips. When asked about how many times a fisherman from the household fished by boat over the past 12 months, respondents from CNMI reported fishing from boats with slightly higher frequency (27% taking two or more trips a month) than respondents from Guam (24% taking two or more trips a month).

Figure 18. Frequency of boat-based fishing trips (for fishing households)



A recent study of small boat fishermen in Guam and CNMI asked fishermen about their motivations and characteristics, including number and type of fishing trips taken in the last 12 months, what they did with the fish they caught, and related questions (Hospital and Beavers 2012; 2014). Comparison of the frequency of boat-based trips suggests that the fishermen in our sample fished less frequently than the fishermen in the small boat study, although the categories used were different in each study.

In the small boat study, 43% of the Guam fishermen and 32% of the CNMI fishermen reported having given away fish or provided fish for fiestas or community events, comparable to the proportions found in our study. About 80% of our fishing household respondents on Guam and 70% on CNMI said they regularly use fish as a food source; this was very consistent with the proportion of fishermen in the small boat survey who said that fish they catch are an important source of food for their families.

Finally, Guam respondents from fishing households were asked whether someone in their household was a member of the Guam Fishermen's Cooperative Association; or if they had purchased fish at the Coop store. Ten percent reported that someone in their household was a member, while nearly half (48%) reported having bought fish at the Coop. This question was asked only to fishing households, so we do not know the percent of the non-fishing households that purchased fish at the Coop.



Limitations of the Study

Interpretation of the results of this study should be conducted with knowledge of its limitations. All estimates provided above are within \pm 4.2% of population values at the 95% confidence level.

The study was conducted by phone, imparting an inherent bias toward residents with phones and those who are willing to answer surveys on them. This is likely to result in oversampling individuals and households of higher economic status since some lower income households may not have a home (landline) phone or mobile phone. The survey was administered using random digit dialing with one fifth of the interviews initiated by cell phones and four-fifths of the surveys conducted on landline phones. Younger and or recently relocated residents may only use cell phones and not landlines which could bias the sample toward older residents and away from those who have recently moved.

Some of the survey questions were designed to address specific needs of managers. The purpose of these questions is to assist managers in prioritizing management actions and goals. Responses to these questions will inform Monument managers in regulating activities within the Monument and outreach activities related to the Monument.

Several survey questions have also been designed to evaluate perspectives about specific claims made by proponents of the Monument prior to its establishment. Conservation NGOs suggested certain benefits – especially economic benefits - would be enjoyed by local residents with the designation of the Monument. The purpose of these questions is to assess how residents feel about these claims now that the Monument has been established.

The researchers are aware that residents in CNMI and Guam speak many languages other than English. Interviewers were capable of conducting the survey in English, Tagalog, or Chamorro, the three most commonly spoken languages in CNMI and Guam. The initial contact was conducted in English which may have dissuaded respondents uncomfortable answering the questions in English from requesting the survey to be conducted in another language. An additional 126 other respondents were contacted who did not speak one of the languages offered; including people speaking Korean, Vietnamese, and Chinese. The preference for conducting the survey in one of the most three commonly spoken languages provides an additional bias in the sample.

Conclusions

This research was designed to provide Monument managers with information about how the Monument and related management issues are perceived by residents of Guam and the CNMI. This information should help managers to develop the Management Plan, design outreach programs, and gauge citizens' future levels of involvement in Monument activities. It would be valuable to conduct another population survey in 3-5 years, to obtain perceptions once there was greater awareness of the Monument and a greater likelihood that associated activities begin to

have an effect in the community. The results also should be of interest to the Pacific Islands Fisheries Science Center as it develops a science plan for the Monument. Many of the results regarding local issues such as marine protected areas should be of interest to Guam and CNMI agencies. The findings can also provide a basis for future research with the region's fishing and non-fishing population, whether or not the focus is the Monument. An attempt was made to present the findings in a format conducive to the utilization and application of the results and if this approach proves useful, it will be followed in the future.

Acknowledgements

This research could not have been accomplished without the assistance of many individuals. We would like to thank the residents of CNMI and Guam who participated in this study for their participation and for sharing their insights. We thank American Directions Group for implementing the survey, and Washington Analytics, especially Harley Heimovitz who managed the survey throughout its administration. We thank the Pacific Islands Regional Office for providing funding and their contribution of Monument managers' interests in survey results. We appreciate the input of many residents and natural resource managers in Guam and CNMI, especially Valerie Brown, John Gourley, Evangeline Lujan, Steve McKagan, and Arnold Palacios, on versions of the survey. Photography contributed by Kevin Lino and Brian Gionfriddo.

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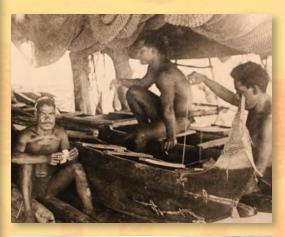
In January 2009, President George W. Bush established the Marianas Trench Marine National Monument (Monument) by Presidential Proclamation 8335. The Monument encompasses approximately 95,216 square miles of area divided into three units within the 200-nm Exclusive Economic Zone around Guam and the Commonwealth of the Northern Mariana Islands (CNMI). The Islands Unit includes both the waters and submerged lands below the mean water line around the three northernmost Mariana Islands: Farallon de Pajaros (also known as Uracas); Maug; and Asuncion. Within the Islands Unit of the monument commercial fishing



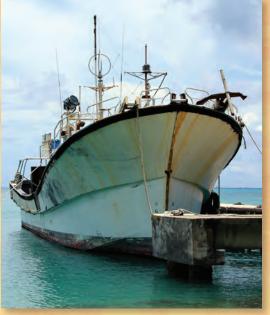
is prohibited but sustenance, recreational, and traditional indigenous fishing can be allowed on a sustainable basis (Proclamation 8335, 2009).

This report summarizes data collected via phone survey with 1,000 residents of Guam and CNMI. The survey contained questions on awareness, knowledge, and attitudes of residents regarding the Monument; preferences for management and scientific research; and levels of interest in becoming involved in Monument management and outreach activities.











This booklet summarizes results of a phone survey of Guam and CNMI residents on management preferences for the Marianas Trench Marine National Monument. In January 2009, President George W. Bush established the Marianas Trench Marine National Monument by Presidential Proclamation 8335.

